Peng Gao

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Education

Ph.D. in Geography, University of South Carolina, Columbia, SC, USA, 2013

M.S. in Soil Science, Institute of Soil Science, Chinese Academy of Sciences, Nanjing, Jiangsu, China, 2007

B.S. in Agriculture, Yangzhou University, Yangzhou, Jiangsu, China, 2004

Employment

08/2020 – Present, Assistant Professor, Department of Earth and Ocean Sciences, University of North Carolina Wilmington

08/2019 – 07/2020, Data and Information Visualization Librarian, Thomas Cooper Library, University of South Carolina.

11/2018 – 06/2019, Postdoc, Department of Watershed Sciences, Utah State University.

09/2013 – 10/2018, Research Associate, Department of Geography, University of South Carolina.

08/2017 – 12/2017, Adjunct Faculty, Department of Social Sciences, Claflin University.

06/2011 - 08/2011, Internship, Center for Forested Wetlands Research, Forest Service, U.S. Department of Agriculture.

Grants

External

Improving Resilience to Coastal Storm Hazards for Vulnerable and Underserved Coastal Communities. *U.S. Coastal Research Program (USCRP)* ($236,638). Wei, Z., Yang, Y., **Gao, P.,** and López, F. 2023 – 2025, *pending*.

Managing Fire in Longleaf Pine Ecosystems in the Context of Anthropogenic Climate Change and Landscape Transformation. *Southeast Climate Adaptation Science Center (USGS)* ($100,000), Kupfer, J.A., Hiers, J.K., **Gao, P.**, Dow, K. and Terando A.J.. 2020-2022.

Internal

Uncertainty as Certainty: The Initiation of a Student-Run Multimedia Information Center on Science Uncertainty in the Context of Weather Hazards and Climate Change. *Applied Learning Strategic Initiative Awards, University of North Carolina Wilmington* ($30,000), Yang, Y, and **Gao, P.** 2022 – 2025.

Assessing Wildfire Risk in the Southeast U. S. Using a Fire Behavior Model. *Research Momentum Fund, University of North Carolina Wilmington* ($5,000), **Gao, P.** 2020 - 2021.

Basin-Level Heavy Rainfall and Flood Analyses. *Advanced Support for Innovative Research Excellence (ASPIRE), University of South Carolina* ($5,000), **Gao, P.** and Carbone, G.. 2017 - 2018.

Awards

Recognition as Faculty of Significant Impact, Division of Student Affairs, University of North Carolina Wilmington, 2021, 2022.

Student Travel Awards, U.S. Regional Association of the International Association for Landscape Ecology (US-IALE), 2013.

Dean's Dissertation Fellowship, College of Arts and Sciences, University of South Carolina, 2012.

National Aeronautics and Space Administration - Michigan State University (NASA - MSU) Professional Enhancement Award, U.S. Regional Association of the International Association for Landscape Ecology (US-IALE), 2012.

Second place in the American Society for Photogrammetry and Remote Sensing (ASPRS) Annual GeoLeague Challenge competition, 2012. (Title: Development of a Repeatable Cost and Time Efficient Remote Sensing Solution for Updating the National Coastal Wetlands Inventory. Team work)

Excellent Thesis, Yangzhou University, 2004.

Publications

Under Review

Dye, A. *, **P. Gao***, J. B. Kim, T. Lei, K. L. Riley, and L. Yocom. High-resolution Wildfire Simulations Reveal Complexity of Climate Change Impacts on Projected Burn Probability for Southern California. *Fire Ecology*.

Carbone, G., **P. Gao**, and J. Lu. Regionalization of Hydroclimate Variables. *Theoretical and Applied Climatology*.

Hutchens, L., **P. Gao**, and J. A. Kupfer. Spatial Patterns of Conservation Benefits, Priorities, and Barriers in the Congaree Biosphere Region. *Southeastern Geographer*.

Zhong, C., H. J. Guo, I. Swan, **P. Gao**, Q. X. Yao, and H. Li. Exploring the Distinctive Characteristics of Global Cities in Recent Urban Expansion Megatrends. *Habitat International*.

* Dual First Authors

Published

Journals

40. Guo, H., B. Yi, Q. Yao, **P. Gao**, H. Li, J. Sun, and C. Zhong. 2022. Identification of Geological Hazards in Mountainous Area with the Combination of the SBAS-Insar and Yolo Model. *Sensors*. 22 (16): 6235.

39. Yao, R.J., J.S. Yang, X.P. Wang, Y. Zhao, H.Q. Li, **P. Gao**, W.P. Xie and X. Zhang. 2022. Improving Soil Salinity Simulation by Assimilating Electromagnetic Induction Data into HYDRUS Model Using Ensemble Kalman Filter. *Journal of Environmental Informatics*, 39(2): 81-96.

38. **Gao, P.**, A.J. Terando, J.A. Kupfer, J.M. Varner, M.C. Stambaugh, and J.K. Hiers. 2021. Robust Projections of Future Fire Probability for the Conterminous United States. *Science of The Total Environment*, 789: 147872.

37. Liu, Y., H. Li, **P. Gao**, and C. Zhong. 2021. Monitoring the Spatiotemporal Dynamics of Urban Green Space and Its Impacts on Thermal Environment in Shenzhen City from 1978 to 2018 with Remote Sensing Data. *Photogrammetric Engineering & Remote Sensing*, 87(2): 81-89.

36. Zhong, C., C. Li, **P. Gao**, and H. Li. 2021. Discovering Vegetation Recovery and Landslide Activities in the Wenchuan Earthquake Area with Landsat Imagery. *Sensors*, 21(15): 5243.

35. Li, C., B. Yi, **P. Gao**, H. Li, J. Sun, X. Chen, and C. Zhong. 2021. Valuable clues for DCNN-based landslide detection from a comparative assessment in the Wenchuan earthquake area. *Sensors*, 21(15): 5191.

34. Lu, J., G. J. Carbone, X. Huang, K. Lackstron, and **P. Gao**. 2020. Mapping the Sensitivity of Agriculture to Drought and Estimating the Effect of Irrigation in the United States, 1950–2016. *Agricultural and Forest Meteorology*, 292–293: 108124.

33. Kupfer, J. A., A. Terando, **P. Gao**, C. Teske, and J. K. Hiers. 2020. Climate Change Projected to Reduce Prescribed Burn Opportunities in the Southeastern US. *International Journal of Wildland Fire*, 764-778.

32. Liu, Y., H. Li, **P. Gao**, and C. Zhong. 2020. Monitoring the Detailed Dynamics of Regional Thermal Environment in a Developing Urban Agglomeration. *Sensors*, 20 (4): 197.

31. Zhong, C., Chen, C., Y. Liu, **P. Gao**, and H. Li. 2019. A Specific Study on the Impacts of PM2.5 on Urban Heat Islands with Detailed In Situ Data and Satellite Images. *Sustainability*, 11(24), 7075.

30. Cheng, Z., Y. Liu, **P. Gao**, W. Chen, H. Li, Y. Hou, T. Nuremangulic, and H. Ma. 2019. Landslide Mapping with Remote Sensing: Challenges and opportunities. *International Journal of Remote Sensing*, 41 (4): 1555 - 1581.

29. Xiao, X., J. Lu, **P. Gao**, G. Riungu, and M. Wang. 2019. Travel Safety on Acadia National Park Roadways. *Journal of Park and Recreation Administration*, 37 (4).

28. Lu, J., G. J. Carbone, and **P. Gao**. 2019. Mapping the agricultural drought based on the long-term AVHRR NDVI and North American Regional Reanalysis (NARR) in the United States, 1981–2013, *Applied Geography*, 104 (2): 10-20.

27. **Gao, P.,** and J. A. Kupfer. 2018. Capitalizing on a Wealth of Spatial Information: Improving Biogeographic Regionalization Through the Use of Spatial Clustering, *Applied Geography*, 99: 98 - 108.

26. **Gao, P.**, G. J. Carbone, J. Lu, and D. Guo. 2018. An Area-based Approach for Estimating Extreme Precipitation Probability, *Geographical Analysis*, 50 (3): 314 - 333.

25. **Gao, P.**, G. J. Carbone, and J. Lu. 2018. Flood Simulation in South Carolina Watersheds Using Different Precipitation Inputs, *Advances in Meteorology*, 2018.

24. Guo, D., H. Jin, **P. Gao** and X. Zhu. 2018. Detecting Spatial Community Structure in Movements, *International Journal of Geographical Information Science*, 32: 7.

23. Meitzen, K. M., Kupfer, J. A., and **P. Gao**. 2018. Modeling Hydrologic Connectivity and Virtual Fish Movement across a Large Southeastern Floodplain, USA, *Aquatic Science*, 80: 5.

22. Lu, J., G. J. Carbone, and **P. Gao**. 2017. Detrending Crop Yield Data for Spatial Visualization of Drought Impacts in the United States, 1895–2014, *Agricultural and Forest Meteorology*, 237-238: 196-208.

21. **Gao, P.**, J. A. Kupfer, X. Zhu, and D. Guo. 2016. Quantifying Animal Trajectories Using Spatial Aggregation and Sequence Analysis – A Case Study of Differentiating Trajectories of Multiple Species, *Geographical Analysis*, 48:275-291.

20. **Gao, P.**, G. J. Carbone, and D. Guo. 2016. Assessment of NARCCAP Model in Simulating Rainfall Extremes Using a Spatially Constrained Regionalization Method, *International Journal of Climatology*, 36: 2368-2378.

19. Yao, R. J., J. S. Yang, D. H. Wu, W. P. Xie, **P. Gao**, and W. H. Jin. 2016. Digital Mapping of Soil Salinity and Crop Yield Across a Coastal Agricultural Landscape Using Repeated Electromagnetic Induction (EMI), *PLoS ONE*, 11(5): e0153377.

18. Yao, R. J., J. S. Yang, D. H. Wu, W. P. Xie, **P. Gao**, and X. P. Wang. 2016. Geostatistical Monitoring of Soil Salinity for Precision Management Using Proximally Sensed Electromagnetic Induction (EMI) Method, *Environmental Earth Sciences*, 75: 1362.

17. Yao, R. J., J. S. Yang, D. H. Wu, W. P. Xie, **P. Gao**, and X. P. Wang. 2016. Characterizing Spatial–Temporal Changes of Soil and Crop Parameters for Precision Management in a Coastal Rainfed

Agroecosystem. *Soil Fertility & Crop Nutrition*, 108 (6): 2462 - 2477.

16. **Gao, P.**, and J. A. Kupfer. 2015. Uncovering Food Web Structure Using a Novel Trophic Similarity Measure, *Ecological Informatics*, 30: 110-118.

15. Kupfer, J. A., K. M. Meitzen, and **P. Gao**. 2015. Flooding and Surface Connectivity of *Taxodium-Nyssa* Swamps in a Southern Floodplain Forest System, *River Research and Applications*, 31(10): 1299-1310.
14. Yao, R.J., J.S. Yang, D.H. Wu, F.R. Li, **P. Gao** and X.P. Wang. 2015. Evaluation of Pedotransfer Functions for Estimating Saturated Hydraulic Conductivity in Coastal Salt-affected Mud Farmland. *Journal of Soils and Sediments*, 15(4): 902-916.
13. Yao, R. J., J. S. Yang, **P. Gao**, X. P. Wang, L. Z. Hong, and M. W. Wang. 2014. Determination of Site-Specific Management Zones Using Soil Physico-Chemical Properties and Crop Yields in Coastal Reclaimed Farmland, *Geoderma*, 232: 381-393.
12. Yao, R. J., J. S. Yang, **P. Gao**, J. B. Zhang, W. H. Jin, and S. P. Yu. 2014. Soil-Quality-Index Model for Assessing the Impact of Groundwater on Soil in an Intensively Farmed Coastal Area of E China, *Journal of Plant Nutrition and Soil Science*, 177(3): 330-342.
11. Yao, R. J., J. S. Yang, **P. Gao**, H. B. Shao, G. M. Liu, and S. P. Yu. 2014. Comparison of Statistical Prediction Methods for Characterizing the Spatial Variability of Apparent Electrical Conductivity in Coastal Salt-Affected Farmland, *Environmental Earth Science*, 71 (1): 233 - 243.
10. **Gao, P.**, J. A. Kupfer, D. Guo, and T. L. Lei. 2013. Identifying Functionally-Connected Habitat Compartments with a Novel Regionalization Technique, *Landscape Ecology*, 28 (10): 1949 - 1959.
9. **Gao, P.**, D. Guo, K. Liao, J. J. Webb, and S. L. Cutter. 2013. Early Detection of Terrorism Outbreaks Using Prospective Space-Time Scan Statistics, *Professional Geographer*, 65 (4) 676 - 691.
8. Yao, R. J., J. S. Yang, **P. Gao**, W. H. Jin, and S. P. Yu. 2013. Determining Minimum Data Set for Soil Quality Assessment of Typical Salt-Affected Farmland in the Coastal Reclamation Area, *Soil & Tillage Research*, 128: 137-148.
7. Yao, R. J., J. S. Yang, **P. Gao**, H. B. Shao, X. B. Chen, and S. P. Yu. 2013. Multivariate Simulation and Assessment of Three Dimensional Spatial Patterns of Coastal Soil Salinity Using Ancillary Variables. *Fresenius Environmental Bulletin*, 22(1): 39 - 52.
6. Yao, R. J., J. S. Yang, J. B. Zhang, **P. Gao**, S, P. Yu and X. P. Wang. 2013. Short-Term Effect of Cultivation and Crop Rotation Systems on Soil Quality Indicators in a Coastal Newly-Reclaimed Farming Area, *Journal of Soils and Sediments*, 13 (8): 1335 - 1350.
5. Kupfer, J. A., **P. Gao**, and D. Guo. 2012. Regionalization of Forest Pattern Metrics for The Continental United States Using Contiguity Constrained Clustering and Partitioning, *Ecological Informatics*, 9: 11-18.
4. Guo, D., X. Zhu, H. Jin, **P. Gao**., and C. Andris. 2012. Discovering Spatial Patterns in Origin-Destination Mobility Data, *Transactions in GIS*, 16 (3): 411-429.
3. Kupfer, J. A. and **P. Gao**. 2011. Spatial Patterns of Ecological Integrity in South Carolina Watersheds, *Southeastern Geographer*, 51: 394-410.
2. **Gao, P.**, X. Shi, D. Yu, H. Wang, W. Sun, and Y. Zhao. 2008. A WebGIS-based China Soil Information Inquiry System, Soils, 40(1): 9-15 (in Chinese).
1. Shi, X, D. Yu, **Gao, P.**, H. Wang, W. Sun, Y. Zhao, and Z. Gong. 2007. Soil Information System of China (SISChina) and its Application, Soils, 39(3): 329-333 (in Chinese).

Proceedings

4. **Gao, P.**, G. Carbone, D. Tufford, A. Patel, and L. Rouen. Assessing Methods to Disaggregate Daily Precipitation for Hydrological Simulation, *Proceedings of the 2012 South Carolina Water Resources Conference.*
3. **Gao, P.**, C. C. Trettin, and C. Yi. Use of Remote Sensing to Inventory Mountain Peatlands in Lesotho, *Proceedings of the 14th International Peat Congress – Peatlands 2012*.
2. **Gao, P.**, C. C. Trettin, and S. Ghoshal. Object-Oriented Segmentation and Classification of Wetlands

within the Khalong-La-Lithunya Catchment, Lesotho, Africa, *Proceedings of* the *20th International Conference on Geoinformatics 2012*.

1. Kupfer, J and **Gao, P**. A Flexible Indicator-Based Approach to Assessing the Ecological Integrity of South Carolina Watersheds, *Proceedings of the 2008 South Carolina Water Resources Conference.*

Teaching Experience

University of North Carolina Wilmington

GGY 215: the Digital Globe

GGY 281: Introduction to Geographic Information Systems (GIS)

GGY 521 / GGY 421: Spatial Programming

GGY 593 / GGY 480: GIS Modeling

GEO 591: Directed Independent Study: Wildfire Modeling

GEO 591: Directed Independent Study: Climate Mapping

Claflin University

GEOG 201: World Geography

University of South Carolina

GEOG 705: Independent Study: Social Network Analysis of Climate Information Usage (Co-supervisor)

GEOG 363: Introduction to Geographic Information Systems (GIS)

Presentations

Invited Presentations

How Can We Use GIS to Determine a 1000-year Rainfall? 16th Annual GIS Day, University of Kansas, Lawrence, KS, 2017.

Conferences

Assessing Wildfire Risk in the Southeast U.S. Using a Fire Behavior Model. North American Regional Association of the International Association for Landscape Ecology (NA-IALE) Annual Meeting. Online. 2022

Robust Projections of Future Fire Probability for the Conterminous United States. 9th International Fire Ecology and Management Congress. Online. 2022

Assessing Wildfire Risk in the Southeast U. S. Using a Fire Behavior Model. Carolinas Climate Resilience Conference. Durham, NC, 2021.

Projected Changes in Fire Probability for the Conterminous United States. North American Regional Association of the International Association for Landscape Ecology (IALE-North America). Online. 2021.

Basins-Level Heavy Rainfall and Flood Analyses, Association of American Geographers (AAG) Annual meeting, New Orleans, LA, 2018.

Impacts of Projected Landscape Transformation on Conservation Corridors in the Southeastern U.S., Regional Association of the International Association for Landscape Ecology (US-IALE) Annual Symposium, Chicago, IL, 2018.

How Extreme Was the October 2015 Precipitation Event in South Carolina? SC Water Resources Conference, Columbia, SC, 2016.

How Extreme Was the October 2015 Precipitation Event in South Carolina? Southeastern Geological

Society of America (GSA) Annual Meeting, Columbia, SC, 2016.

NARCCAP Model Comparison of Extreme Rainfall Intensity in the Continental United States, Association of American Geographers (AAG) Annual Meeting, Chicago, IL, 2015.

Comparison of Rainfall Intensity in Downscaled Climate Model Output for the Carolinas, Association of American Geographers (AAG) Annual Meeting, Tampa, FL, 2014.

Regionalization of White-Tailed Deer Movement Patterns Using High Resolution Telemetry Data, U.S. Regional Association of the International Association for Landscape Ecology (US-IALE) Annual Symposium, Austin, TX, 2013.

Assessing Methods to Disaggregate Daily Precipitation for Hydrological Simulation, Association of American Geographers (AAG) Annual Meeting, Los Angeles, CA, 2013.

Assessing Methods to Disaggregate Daily Precipitation for Hydrological Simulation, South Carolina Water Resources Conference, Columbia, SC, 2012.

Identifying Functionally-Connected Habitat Compartments with a Novel Regionalization Technique, U.S. Regional Association of the International Association for Landscape Ecology (US-IALE) Annual Symposium, Newport, RI, 2012.

Early Detection of Terrorism Clusters Using Space-Time Scan Statistics, Association of American Geographers (AAG) Annual Meeting, Seattle, WA, 2011.

A Flexible Indicator-Based Approach to Assessing the Ecological Integrity of South Carolina Watersheds (Poster), Association of American Geographers (AAG) Annual Meeting, Las Vegas, NV, 2009.

Services

Student Committees

Graduate Advisee

Kevin Young, M.S. Geoscience (Thesis), *In progress*

Undergraduate Advisee

Luke Bumgarner, B.S. Geography and Geospatial Sciences, *In progress*

Wesley Sanderson, B.S. Geography and Geospatial Sciences, *In progress*

Joseph Small, B.S. Geography and Geospatial Sciences, *In progress*

Jake Smith, B.S. Geography and Geospatial Sciences, *In progress*

Graduate Committee

Thomas Hutsler, M.S. Geoscience (Thesis), Detecting Woody Plants in Southern Arizona Using Data from the National Ecological Observatory Network (NEON), *Completed*

Christopher Roan, M.S. Geoscience (Thesis), *In progress*

Autumn Fournier, M.S. Geoscience (Portfolio), *Completed*

James Wu, M.S. Geoscience (Portfolio), *Completed*

James Giddens, M.S. Geoscience (Portfolio), *Completed*

Lukas Farlow, M.S. Geoscience (Portfolio), *In progress*

Undergraduate Honored Thesis Committee

Melia Eaton, Analysis of the Deep Direct-Use Geothermal Potential of the Upper Atlantic Coastal Plain, North Carolina, B.S. Geology, *Completed*

Grant Proposal Reviewer

SC Sea Grant Consortium, July 2021

Research Grants Council of Hong Kong, March 2021

Department, College, and University Service

University of North Carolina Wilmington

Faculty Senate Evaluation Committee
Campus Recreational Advisory Committee
Public Relationship / Outreach Committee Chair
Graduate Admission Committee
Geography Curriculum Committee
GEOINT Deputy Director

University of South Carolina

Member of Big Data Health Sciences Center Geospatial Core
Manager of Data Visualization Lab
University Libraries Assessment Team
University Libraries Diversity and Inclusion Committee

Editorial Service

Associate Editor

Fire Ecology

Journal Manuscript Reviewer

Agriculture; Dataset Papers in Science; Ecological Informatics; Environmental Engineering and Management Journal; Environmental Monitoring and Assessment; Environmental Processes; Fire; GIScience & Remote Sensing; IEEE Conference on Visual Analytics Science and Technology; ISPRS Journal of Photogrammetry and Remote Sensing; Journal of Applied Remote Sensing; Journal of Environmental Informatics; Journal of Geographical Systems; Land; Landscape Ecology; Landscape and Urban Planning; Pedosphere; Remote Sensing; Transactions in GIS; Sensors.

Society Membership and Service

North American Regional Association of the International Association for Landscape Ecology (IALE-North America)

Association for Fire Ecology

Association of American Geographers (AAG)

Newsletter Committee, Chinese Professionals in Geographic Information Systems (CPGIS). 2012 - 2013.